Web Design
Course

LECTURE FIVE
HTML and XHTML

**Computer Science
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2.6 Font Styles and Sizes

Early Web designers used a collection of tags to set font styles and sizes. For example, <i> specified italics and <b> specified bold. Since the advent of cascading style sheets the use of these tags has become passé. There are a few tags for fonts that are still in widespread use, called *content-based style tags*. These tags are called content based because they indicate the particular kind of text that appears in their content. Three of the most commonly used content-based tags are the emphasis tag, the strong tag, and the code tag. The emphasis tag, <em>, specifies that its textual content is special and should be displayed in some way that indicates this distinctiveness. Most browsers use italics for such content. The strong tag, <strong> is like the emphasis tag, but more so. Browsers often set the content of strong elements in bold. The code tag, <code>, is used to specify a monospace font, usually for program code. For example, consider the following element:

<code> cost = quantity * price </code> This markup would be displayed as shown in **Figure 8**.

Figure 8 The <code> element

Subscript and superscript characters can be specified by the <sub> and <sup> tags, respectively. These are not content-based tags. For example, X₂³ + y₁² would be displayed as shown in **Figure 9**.

$$x_2^3 + y_1^2$$

Figure 9 The <sub> and <sup> elements

Character-modifying tags are not affected by <blockquote>, except when there is a conflict. For example, if the text content of <blockquote> is set in italics and a part of that text is made the content of an <em> tag, the <em> tag would have no effect. XHTML tags are categorized as being either block or inline. The content of an *inline* tag appears on the current line. So, an inline tag does not implicitly include a line break. One exception is br, which is an inline tag, but its entire purpose is to insert a line break in the content.

A *block* tag breaks the current line so that its content appears on a new line. The heading and blockquote tags are block tags, whereas <em> and <strong> are inline tags. In XHTML, block tags cannot appear in the content of inline tags. Therefore, a block tag can never be nested directly in an inline tag. Also, inline tags and text cannot be directly nested in body or form elements. Only block tags can be so nested. That is why the example greet.html has the text content of its body nested in a paragraph element.

2.7 Character Entities

XHTML provides a collection of special characters that are sometimes needed in a document but cannot be typed as themselves. In some cases, these characters are used in XHTML in some special way—for example, >, <, and &. In other cases, the characters do not appear on keyboards, such as the small raised circle that represents "degrees" in a reference to temperature. Finally, there is the nonbreaking space, which browsers regard as a hard space—they do not squeeze them out, as they do other multiple spaces. These special characters are defined as *entities,* which are codes for the characters. An entity in a document is replaced by its associated character by the browser. **Table 1** lists some of the most commonly used entities.

Table 1 Some commonly used entities

Character	Entity	Meaning
&	&	Ampersand
<	<	Is less than
>	>	Is greater than
"	"	Double quote
'	'	Single quote (apostrophe)
$\frac{1}{4}$	¼	One-quarter
$\frac{1}{2}$	½	One-half
$\frac{3}{4}$	¾	Three-quarters
°	°	Degree
(space)		Nonbreaking space

2.8 Horizontal Rules

The parts of a document can be separated from each other, making the document easier to read, by placing horizontal lines between them. Such lines are called *horizontal rules*, and the block tag that creates them is <hr />. The <hr /> tag causes a line break (ending the current line) and places a line across the screen. The browser chooses the thickness, length, and horizontal placement of the line. Typically, browsers display lines that are three pixels thick. Note again the slash in the <hr /> tag, indicating that this tag has no content and no closing tag.

2.9 The meta Element

The meta element is used to provide additional information about a document. The meta tag has no content; rather, all of the information provided is specified with attributes. The two attributes that are used to provide information are name and content. The user makes up a name as the value of the name attribute and specifies information through the content attribute. One commonly chosen name is keywords; the values of the content attribute associated with the keywords are those which the author of a document believes characterizes his or her document. An example is <meta name = "keywords" content = "binary trees, linked lists, stacks" /> Web search engines use the information provided with the meta element to categorize Web documents in their indices. So, if the author of a document seeks widespread exposure for the document, one or more meta elements are included to ensure that it will be found by Web search engines. For example, if an entire book were published as a Web document, it might have the following meta elements:

```
<meta name = "Title" content = "Don Quixote" />
<meta name = "Author"  content = "Miguel Cervantes" />
<meta  name = "keywords"  content = "novel,
 Spanish literature, groundbreaking work" />
```

3- Images

The inclusion of images in a document can dramatically enhance its appearance (although images slow the document-download process considerably for clients who do not have high-speed Internet access). The image is stored in a file, which is specified by an XHTML request. The image is inserted into the display of the document by the browser.

3.1 Image Formats

The two most common methods of representing images are the Graphic Interchange Format (GIF, pronounced like the first syllable of *jiffy*) and the Joint Photographic Experts Group (JPEG, pronounced *jay-peg*) format. Most contemporary browsers can render images in either of these two formats. Files in both formats are compressed to reduce storage needs and provide faster transfer over the Internet. The GIF format uses 8-bit color representations for pixels, allowing a pixel to have 256 different colors. Files containing GIF images use the .gif (or .GIF) extension on their names. GIF images can be made to appear transparent. The JPEG format uses 24-bit color representations for pixels, which allows JPEG images to include more than 16 million different colors. Files that store JPEG images use the .jpg (or .JPG or .jpeg) extension on their names. The compression algorithm used by JPEG is better at shrinking an image than the one used by GIF. This compression process actually loses some of the color accuracy of the image, but because there is so much to begin with, the loss is rarely discernible by the user. Because of this powerful compression process, even though a JPEG image has much more color information than a GIF image of the same subject, the JPEG image can be smaller than the GIF image. Hence, JPEG images are often preferred to GIF images. The disadvantage of JPEG is that it does not support transparency. A third image format is now gaining popularity: Portable Network Graphics (PNG, pronounced *ping*. Actually, PNG is a good replacement for both GIF and JPEG because it has the best characteristics of each (the possibility of transparency, as provided by GIF and the same large number of colors as JPEG). One drawback of PNG is that, because its compression algorithm does not sacrifice picture clarity, its images require more space than comparable JPEG images.

3.2 The <img /> Tag

The image tag, <img />, which is an inline tag, specifies an image that is to appear in a document. In its simplest form, the image tag includes two attributes: src, which specifies the file containing the image; and alt, which specifies text to be displayed when it is not possible to display the image. If the file is in the same directory as the XHTML file of the document, the value of src is just the image's file name. In many cases, image files are stored in a subdirectory of the directory where the XHTML files are stored. For example, the image files might be stored in a subdirectory named images. If the image file's name is stars.jpg and the image file is stored in the images subdirectory, the value of src would be as follows:

> "images/stars.jpg"

Some seriously aged browsers are not capable of displaying images. When such a browser finds an <img /> tag, it simply ignores its content, possibly leaving the user confused by the text in the neighborhood of where the image was supposed to be. Also, graphical browsers, which *are* capable of displaying images, may have image downloading disabled by the browser user. This is done when the Internet connection is slow and the user chooses not to wait for images to download. It is also done by visually impaired users. In any case, it is helpful to have some text displayed in place of the ignored image. For these reasons, the alt attribute is required by XHTML. The value of alt is displayed whenever the browser cannot or has been instructed not to display the image. Two optional attributes of img—width and height—can be included to specify (in pixels) the size of the rectangle for the image. These attributes can be used to scale the size of the image (i.e., to make it larger or smaller). Care must be taken to ensure that the image is not distorted in the resizing. For example, if the

image is square, the width and height attribute values must be kept equal when they are changed. The following is an example of an image element:

****

The following example extends the airplane ad document to include information about a specific airplane and its image:

```
<?xml version = "1.0" encoding = "utf-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
   "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">

<!-- image.html
     An example to illustrate an image
     -->
<html xmlns = "http://www.w3.org/1999/xhtml">
  <head> <title> Images </title>
  </head>
  <body>
    <h1> Aidan's Airplanes </h1>
    <h2> The best in used airplanes </h2>
    <h3> "We've got them by the hangarful" </h3>
    <h2> Special of the month </h2>
    <p>
      1960 Cessna 210 <br />
      577 hours since major engine overhaul<br />
      1022 hours since prop overhaul <br /><br />
      <img src = "c210new.jpg"  alt = "Picture of a Cessna 210" />
      <br />
      Buy this fine airplane today at a remarkably low price
      <br />
      Call 999-555-1111 today!
    </p>
  </body>
</html>
```
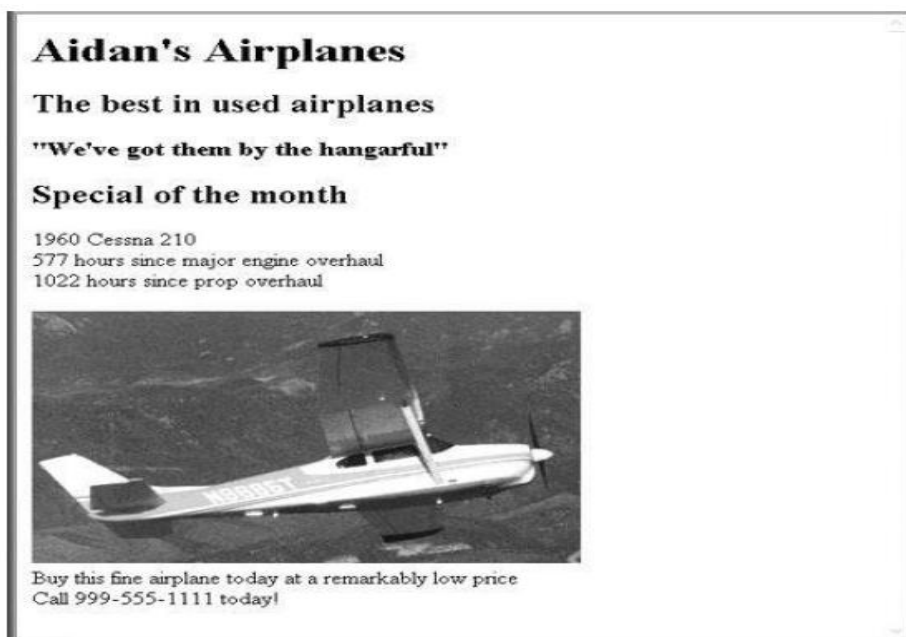

Figure 10 shows a browser display of image.html

4- Hypertext Links

A hypertext link in an XHTML document, which we simply call a *link* here, acts as a pointer to some particular place in some Web resource. That resource can be an XHTML document

anywhere on the Web, or it may be the document currently being displayed. Without links, Web documents would be boring and tedious to read. There would be no convenient way for the browser user to get from one document to a logically related document. Most Web sites consist of many different documents, all logically linked. Therefore, links are essential to building an interesting Web site.

4.1 Links

A link that points to a different resource specifies the address of that resource. Such an address might be a file name, a directory path and a file name, or a complete URL. If a link points to a specific place in any document other than the beginning, that place somehow must be marked. Links are specified in an attribute of an anchor tag (<a>), which is an inline tag. The anchor tag that specifies a link is called the *source* of that link. The document whose address is specified in a link is called the *target* of that link.

As is the case with many tags, the anchor tag can include many different attributes. However, for creating links, only one attribute is required: href (an acronym for *hy*pertext *ref*erence). The value assigned to href specifies the target of the link. If the target is in another document in the same directory, the target is just the document's file name. If the target document is in some other directory, the UNIX pathname conventions are used. So, an XHTML file named c210data.html in a subdirectory of the directory in which the source XHTML files—named, say, airplanes—is specified in the href attribute value as "airplanes/c210data.html". This is the relative method of document addressing. Absolute file addresses could be used in which the entire path name for the file is given. However, relative links are easier to maintain, especially if a hierarchy of XHTML files must be moved. If the document is on some other machine (not the server providing the document that includes the link), obviously the complete URL must be used.

The content of an anchor tag, which becomes the clickable link the user sees, is restricted to text, line breaks, images, and headings. Links are usually implicitly rendered in a different color than that of the surrounding text. Sometimes they are also underlined. When the mouse cursor is placed over the anchor-tag content and the left mouse button is pressed, the link is taken by the browser. If the target is in a different document, that document is loaded and displayed, replacing the currently displayed document. If the target is in the current document, the document is scrolled by the browser to display the part of the document in which the target of the link is defined. As an example of a link to the top of a different document, consider the following document, which adds a link to the document displayed in Figure 10:

```
<?xml version = "1.0" encoding = "utf-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
   "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">

<!-- link.html
      An example to illustrate a link
      -->
<html xmlns = "http://www.w3.org/1999/xhtml">
   <head> <title> A link </title>
   </head>
   <body>
      <h1> Aidan's Airplanes </h1>
      <h2> The best in used airplanes </h2>
      <h3> "We've got them by the hangarful" </h3>
      <h2> Special of the month </h2>
      <p>
         1960 Cessna 210 <br />
         <a href = "C210data.html"> Information on the Cessna 210 </a>
      </p>
   </body>
</html>
```

In this case, the target is a complete document that is stored in the same directory as the XHTML document. Figure 11 shows a browser display of link.html. When the link shown in Figure 11 is clicked, the browser displays the screen shown in Figure 12.
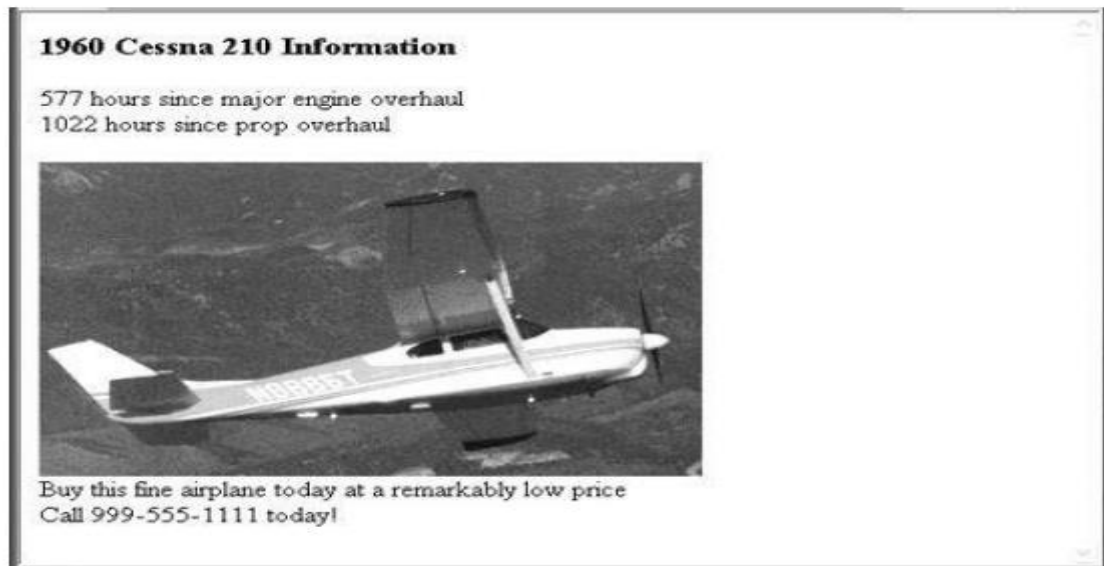

Figure 11 Display of link.html

Figure 12 Following the link from link.html

Links can include images in their content, in which case the browser displays the image together with the link:

```
<a href = "c210data.html" >
    <img src = "small-airplane.jpg"
            alt = "An image of a small airplane" />
        Information on the Cessna 210
</a>
```

An image itself can be an effective link (the content of the anchor element). For example, an image of a small house can be used for the link to the home page of a site. The content of an anchor element for such a link is just the image element.

4.2- Targets within Documents

If the target of a link is not at the beginning of a document, it must be some element within the document, in which case there must be some means of specifying it. The target element can include an id attribute, which can then be used to identify it in an href attribute. Consider the following example:

<h2 id = "avionics"> Avionics </h2>

Nearly all elements can include an id attribute. The value of an id attribute must be unique within the document. If the target is in the same document as the link, the target is specified in the href attribute value by preceding the id value with a pound sign (#), as in the following example:

** What about avionics? **

When the "What about avionics?" Link is taken; the browser moves the display so that the h2 element whose id is avionics is at the top. When the target is a part or fragment of another document, the name of the part is specified at the end of the URL, separated by a pound sign (#), as in this example:

** Avionics **

4.3- Using Links

One common use of links to parts of the same document is to provide a table of contents in which each entry has a link. This technique provides a convenient way for the user to get to the various parts of the document simply and quickly. Such a table of contents is implemented as a stylized list of links by using the list specification capabilities of XHTML. A link should blend into the surrounding text as much as possible so that reading the document without clicking any of the links is easy and natural.